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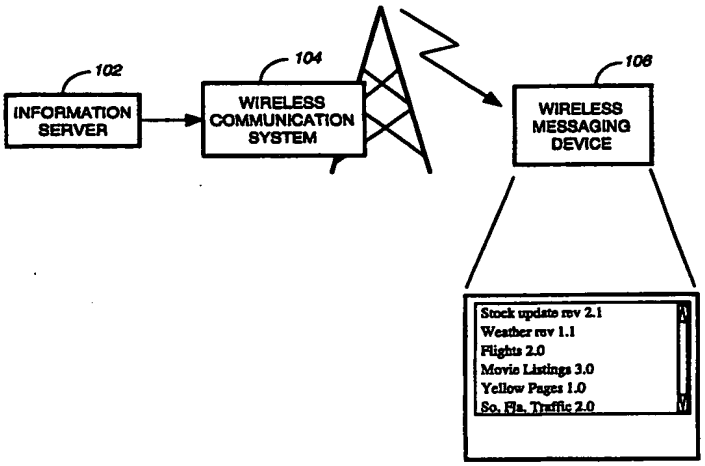

(57) Abstract

A wireless two-way messaging system (100) has an information server (102) that stores one or more wireless application programs and permits access to corresponding information for use with the wireless application programs. A wireless two-way communication terminal (104) is coupled to the information server (102). The wireless two-way communication terminal (104) operates to deliver the wireless application program and its corresponding information to a wireless two-way messaging device (106) in response to a request for delivery. Once received by the wireless two-way messaging device (106), the wireless application program operates to allow communication of application specific request and response messages between the wireless two-way messaging device (106) and the wireless two-way communication terminal (104) for accessing the corresponding information.

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WIRELESS TWO-WAY MESSAGING SYSTEM

Field of the Invention

This invention relates in general to wireless message delivery systems and more particularly to a wireless message delivery system capable of handling two-way applications for sending and receiving specific information.

Background of the Invention

In wireless messaging systems such as those including wireless messaging devices like selective call receivers, information delivery has been historically limited to one-way messages initiated by a remote user or service provider. Message initiation comprised telephone or terminal based entry devices coupled to a messaging signalling terminal or the like. The messaging signalling terminal operated to deliver selective call messages in a conventional manner.

With the progression of wireless messaging into everyday activities and lifestyles, the conventional messaging scenario, that of delivering a phone number to a selective call receiver, yields limited utility when compared to wired information services available over the World Wide Web (www) or Internet in general. Conventional wireless systems cannot accommodate applications such as financial transactions, remote ordering, or appointment scheduling.

Thus, what is needed is a method and apparatus for delivering enhanced information content to a two-way wireless messaging device, while maintaining compatibility with existing wired resources such as legacy databases, and transparently accommodating applications such as financial transactions, remote ordering, appointment scheduling, and the request and delivery of general information.

Brief Description of the Drawings

FIG. 1 is a block diagram of a wireless message delivery system showing a list of wireless application programs delivered to the two-way wireless messaging device in accordance with the preferred embodiment of the present invention.

FIG. 2 is a block diagram of the wireless message delivery system displaying a selected wireless application program and requesting corresponding information from an information server.

FIG. 3 is a block diagram of the wireless message delivery system displaying several selection screens based on the corresponding information delivered to the two-way wireless messaging device, and selections that represent specific requests to be communicated to the wireless communication system for retrieving information from an information server.

FIG. 4 is a block diagram of the wireless message delivery system displaying a delivered message comprising information retrieved from the information server in response to the specific requests communicated to the wireless communication system.

Description of a Preferred Embodiment

Referring to FIG. 1, the block diagram illustrates a wireless message delivery system **102**, **104**, **106** showing a list of wireless application programs **110** delivered to the two-way wireless messaging device **106**. The information server **102** may also include an intermediate server (not shown) that translates information requests and responses (queries) between the two-way wireless messaging device **106** and a dissimilar information server having incompatible database access commands or structures. A program, which may execute at the information server **102** or the wireless communication terminal **104**, operates to notify one or more two-way wireless messaging devices **106** of the type of wireless application programs and their availability. Preferably, the wireless

application programs are stored in the information server **102**. However, the wireless application programs may be stored in either permanent or temporary memory in the two-way wireless messaging device **106**, as well as in the wireless communication terminal **104**. The wireless application programs may be invoked after delivery to the two-way wireless messaging device **106**, thus allowing for the expansion or extension of the intrinsic capabilities associated with the two-way wireless messaging device **106**. This software extendibility results in a more attractive messaging device to a consumer because unlike conventional messaging devices, the user need not replace the complete device to gain new features and functions.

The wireless communication terminal **104** may include the functionality of the intermediate server mentioned in the preceding text. This functionality includes providing connectivity between the information server **102** which accesses web sites or a database, and the wireless communication terminal **104**.

Operationally, a list of available wireless application programs is sent to the two-way wireless messaging device **106** from the intermediate server. The message containing this list can be either broadcast to all two-way wireless messaging devices or delivered point-to-point to a specific two-way wireless messaging device, during off-peak times or as a priority message with minimal latency.

The list may be comprised as a structured text string with the wireless application program title, revision information, etc., as well as header information to route the message when it is received by the two-way wireless messaging device **106**.

When the two-way wireless messaging device **106** receives the list message, the list of wireless application programs contained in the list message is compared to those wireless application programs already existing in the two-way wireless messaging device **106**. The ones that are different (including revisions of existing applications) are displayed to the user for selection which will generate a request for delivery of the selected wireless application programs.

Referring to FIG. 2, the illustration shows a block diagram of the wireless message delivery system displaying a selected wireless application program and requesting corresponding information from an information server.

In this example, the request represents is asking for delivery of the selected wireless application program. This request is communicated back to the wireless communication terminal **104** which retrieves the selected wireless application program(s) from the information server **102**, and delivers them to the two-way wireless messaging device **106**.

The wireless application programs may comprise a template including a text string which defines user interface objects (text entry boxes, list boxes, buttons), parameters which define their appearance, behaviors and placement on the screen of the two-way wireless messaging device **106**. The text string may also define a hierarchy of order. For example, the results of one question to the user may invoke different follow-up questions. Additionally, the wireless application program may define both "demand" formats (for structuring requests or queries) as well as "response format information" (for the results of the query) including notification options.

Alternatively, these elements may be described through the use of a interpreted programming language, or a compiled application. Preferably, all components necessary for execution of the wireless application program would reside locally on the two-way wireless messaging device **106**. However, to maintain security or for other commercial reasons (e.g., maintaining proprietary code in secrecy), the wireless application programs may be segmented into local and remote executable and resource portions. In any case, the wireless application programs serve to enhance the operational characteristics of the two-way wireless messaging device **106** by extending its intrinsic capabilities.

Referring to FIG. 3, the illustration shows a block diagram of the wireless message delivery system displaying several selection screens based on the corresponding information delivered to the two-way wireless messaging device, and selections that represent specific requests to be

communicated to the wireless communication system for retrieving information from an information server.

When the deliver wireless application program is launched, the two-way wireless messaging device **106** generates a screen from the information contained in the wireless application program. For a demand/response wireless application program, the user may be guided through a series of questions, the answer of which are used to compose a query which is sent by the two-way wireless messaging device **106** to the information server **102**.

The wireless communication terminal **104** receives and logs the query and two-way wireless messaging device identifier, interprets the query, identifies an appropriate information source, and structures a database query to an appropriate information server. This query could take the form of an SQL (structured query language) command, a HTML (hyper text markup language) script call, or any other appropriate information source query. Once the query is generated, the wireless communication terminal **104** retrieves the requested information from a selected database via the information server **102**. After the wireless communication terminal **104** receives the response, it looks up the respective two-way wireless messaging device identifier, formats the message for wireless delivery, and sends it to the two-way wireless messaging device corresponding with the identifier. As before, this message can be delivered to the two-way wireless messaging device via a broadcast or point-to-point transmission, during off-peak hours or as soon as possible.

Referring to FIG. 4, the illustration shows a block diagram of the wireless message delivery system displaying a delivered message comprising information retrieved from the information server in response to the specific requests communicated to the wireless communication system.

The message received by the may be viewed as an ordinary message, or it may be formatted by the associated wireless application program with a specific display format. The message or the wireless application program may also contain information which is used to define additional query options such as "send more information" or "route information to fax".

In summary, the present invention is a wireless two-way messaging system as follows. An information server stores one or more wireless application programs and permits access to corresponding information for use with the wireless application programs. A wireless two-way communication terminal is coupled to the information server. The wireless two-way communication terminal operates to deliver the wireless application program and its corresponding information to a wireless two-way messaging device in response to a request for delivery. Once received by the wireless two-way messaging device, the wireless application program operates to allow communication of application specific request and response messages between the wireless two-way messaging device and the wireless two-way communication terminal for accessing the corresponding information.

The wireless application program mentioned is chosen from a plurality of wireless application programs that allow specific request and response messages. These wireless application programs may be stored at several points in the wireless two-way messaging system.

Regarding the request for delivery of the wireless application program or its corresponding information, this request may be initiated as a selection by a user or a system. The selection consists of at least one of a plurality of wireless application programs that allow specific request and response messages.

Selected wireless application programs or corresponding information may be delivered exclusively to the wireless two-way messaging device or non-exclusively to one or more wireless two-way messaging devices with a minimum time delay. Alternatively, selected wireless application programs may be delivered to selected wireless two-way messaging devices when the wireless two-way communication terminal is operating with a message load significantly below a peak message load. This deferred delivery takes advantage of the light system loading during late night hours or like periods to effectively deliver selected wireless application programs and/or corresponding information.

The wireless two-way messaging system described above operates using a method comprising the following steps. The wireless two-way communication terminal sends a list of at least one wireless application program to a wireless two-way messaging device. The wireless two-way messaging device selects at least one wireless application program from the list and requests delivery of the selected wireless application program and its corresponding information. The wireless two-way communication terminal then delivers the requested selected wireless application program and its corresponding information to the wireless two-way messaging device.

Additionally, the wireless two-way messaging device may request information corresponding with an operative wireless application program by communicating an information request to the wireless two-way communication terminal. The wireless two-way communication terminal operates to receive the information request and respond to the wireless two-way messaging device, a response indicating one of a success and failure of the information request.

Alternatively, the wireless two-way communication terminal operates to select at least one wireless application program from a list as a selected wireless application program and information corresponding with the selected wireless application program, request delivery of at least one selected wireless application program and its corresponding information to a wireless two-way messaging device; and deliver a requested at least one selected wireless application program and its corresponding information to the wireless two-way messaging device. In this fashion, the wireless two-way communication terminal may push content (both program and corresponding or related information) to the wireless two-way messaging device.

Similarly, the wireless two-way messaging device may "pull" content by requesting information corresponding with an operative wireless application program and communicating an information request to the wireless two-way communication terminal. In turn, the wireless two-way communication terminal receives the information request and responds to the

wireless two-way messaging device with a response indicating one of a success and failure of the information request.

Finally, one of ordinary skill in the art will realize that the apparatus and procedures described herein as a preferred embodiment of the present invention may be modified to use alternate technologies such as hardware or software implementations, without exceeding the scope of the claimed invention.

We claim:

CLAIMS

1. A wireless two-way messaging system, comprising:

an information server having access to a wireless application program and corresponding information for use with the wireless application program;

a wireless two-way communication terminal coupled to the information server, the wireless two-way communication terminal operative to deliver the wireless application program and its corresponding information in response to a request for delivery; and

a wireless two-way messaging device that generates the request for delivery of the wireless application program and its corresponding information, the wireless application program operating to allow communication of application specific request and response messages between the wireless two-way messaging device and the wireless two-way communication terminal for accessing the corresponding information.

2. The wireless two-way messaging system according to claim 1 wherein the wireless application program is chosen from one of a plurality of wireless application programs that allow specific request and response messages.

3. The wireless two-way messaging system according to claim 1 wherein the request for delivery of the wireless application program and its corresponding information comprises a user initiated selection of at least one of a plurality of wireless application programs that allow specific request and response messages.

4. The wireless two-way messaging system according to claim 1 wherein the request for delivery of the wireless application program and its corresponding information comprises a system initiated selection of at least one of a plurality of wireless application programs that allow specific request and response messages.

5. The wireless two-way messaging system according to claim 1 wherein a selected one of a plurality of wireless application programs is delivered exclusively to the wireless two-way messaging device with a minimum time delay.

6. The wireless two-way messaging system according to claim 1 wherein a selected plurality of wireless application programs is delivered exclusively to the wireless two-way messaging device with a minimum time delay.

7. The wireless two-way messaging system according to claim 1 wherein a selected one of a plurality of wireless application programs is delivered to the wireless two-way messaging device as well as other wireless two-way messaging devices, with a minimum time delay.

8. The wireless two-way messaging system according to claim 1 wherein a selected plurality of wireless application programs is delivered to the wireless two-way messaging device as well as other wireless two-way messaging devices, with a minimum time delay.

9. The wireless two-way messaging system according to claim 1 wherein a selected one of a plurality of wireless application programs is delivered exclusively to the wireless two-way messaging device when the wireless two-way communication terminal is operating with a message load significantly below a peak message load.

10. The wireless two-way messaging system according to claim 1 wherein a selected plurality of wireless application programs is delivered exclusively to the wireless two-way messaging device when the wireless two-way communication terminal is operating with a message load significantly below a peak message load.

11. The wireless two-way messaging system according to claim 1 wherein a selected one of a plurality of wireless application programs is delivered to the wireless two-way messaging device as well as other wireless two-way messaging devices, when the wireless two-way communication terminal is operating with a message load significantly below a peak message load.

12. The wireless two-way messaging system according to claim 1 wherein a selected plurality of wireless application programs is delivered to the wireless two-way messaging device as well as other wireless two-way messaging devices, when the wireless two-way communication terminal is operating with a message load significantly below a peak message load.

13. In a wireless two-way messaging system, a method comprising the steps of:

at a wireless two-way communication terminal:

sending a list of at least one wireless application program to a wireless two-way messaging device;

at the wireless two-way messaging device:

selecting at least one wireless application program from the list as a selected wireless application program and information corresponding with the selected wireless application program; and

requesting delivery of at least one selected wireless application program and its corresponding information; and

at the wireless two-way communication terminal:

delivering a requested at least one selected wireless application program and its corresponding information to the wireless two-way messaging device.

14. The method according to claim 13 further comprising the steps of:

at the wireless two-way messaging device:

requesting information corresponding with an operative wireless application program; and

communicating an information request to the wireless two-way communication terminal; and

at the wireless two-way communication terminal:

receiving the information request; and

responding to the wireless two-way messaging device, a response indicating one of a success and failure of the information request.

15. In a wireless two-way messaging system, a method comprising the steps of:

at a wireless two-way communication terminal:

selecting at least one wireless application program from a list as a selected wireless application program and information corresponding with the selected wireless application program;

requesting delivery of at least one selected wireless application program and its corresponding information to a wireless two-way messaging device; and

delivering a requested at least one selected wireless application program and its corresponding information to the wireless two-way messaging device.

16. The method according to claim 15 further comprising the steps of:

at the wireless two-way messaging device:

requesting information corresponding with an operative wireless application program; and

communicating an information request to the wireless two-way communication terminal; and

at the wireless two-way communication terminal:

receiving the information request; and

responding to the wireless two-way messaging device, a response indicating one of a success and failure of the information request.

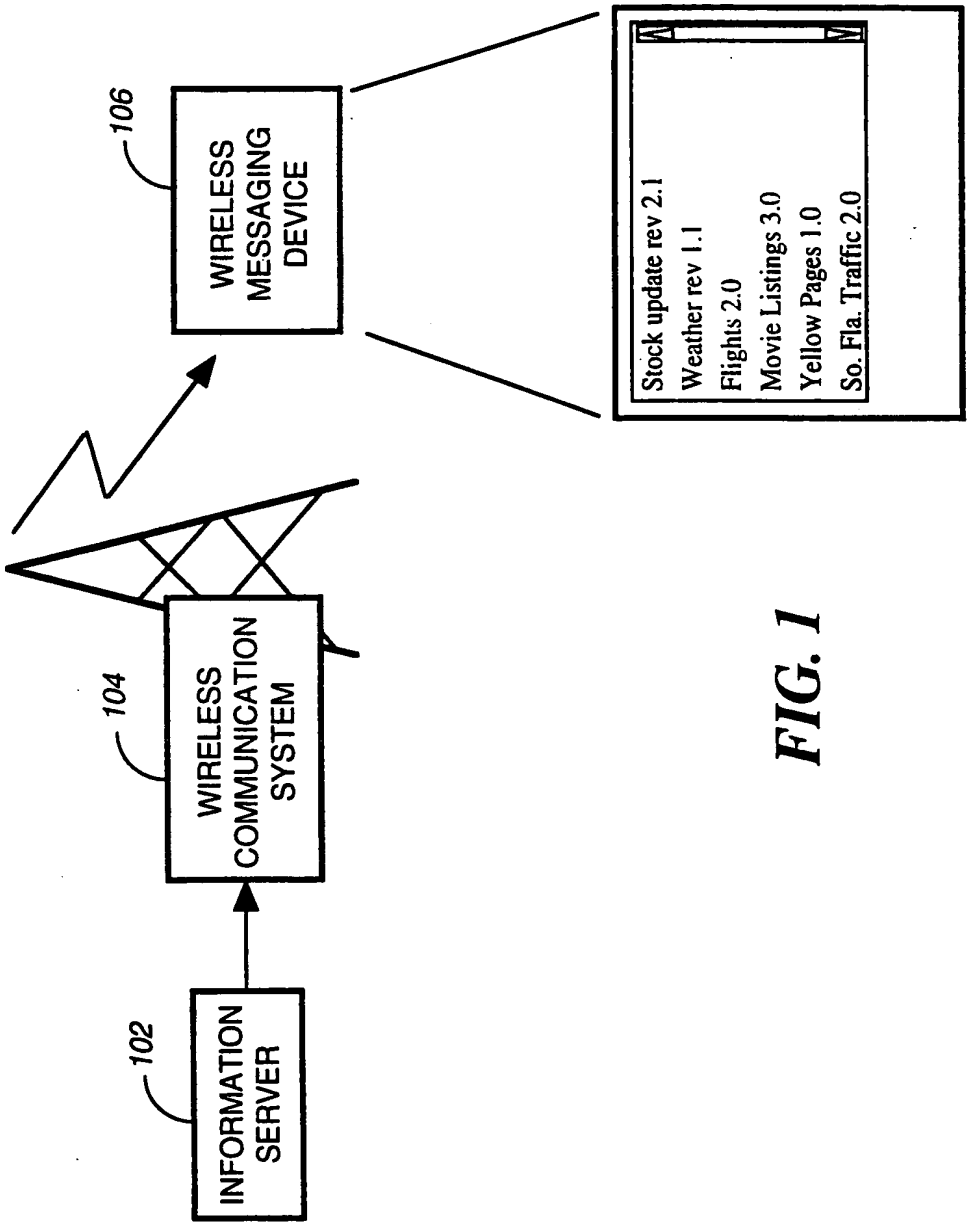
INFORMATION SERVER
102
WIRELESS COMMUNICATION SYSTEM
104
WIRELESS MESSAGING DEVICE
106
Stock update rev 2.1
Weather rev 1.1
Flights 2.0
Movie Listings 3.0
Yellow Pages 1.0
So. Fla. Traffic 2.0

FIG. 1

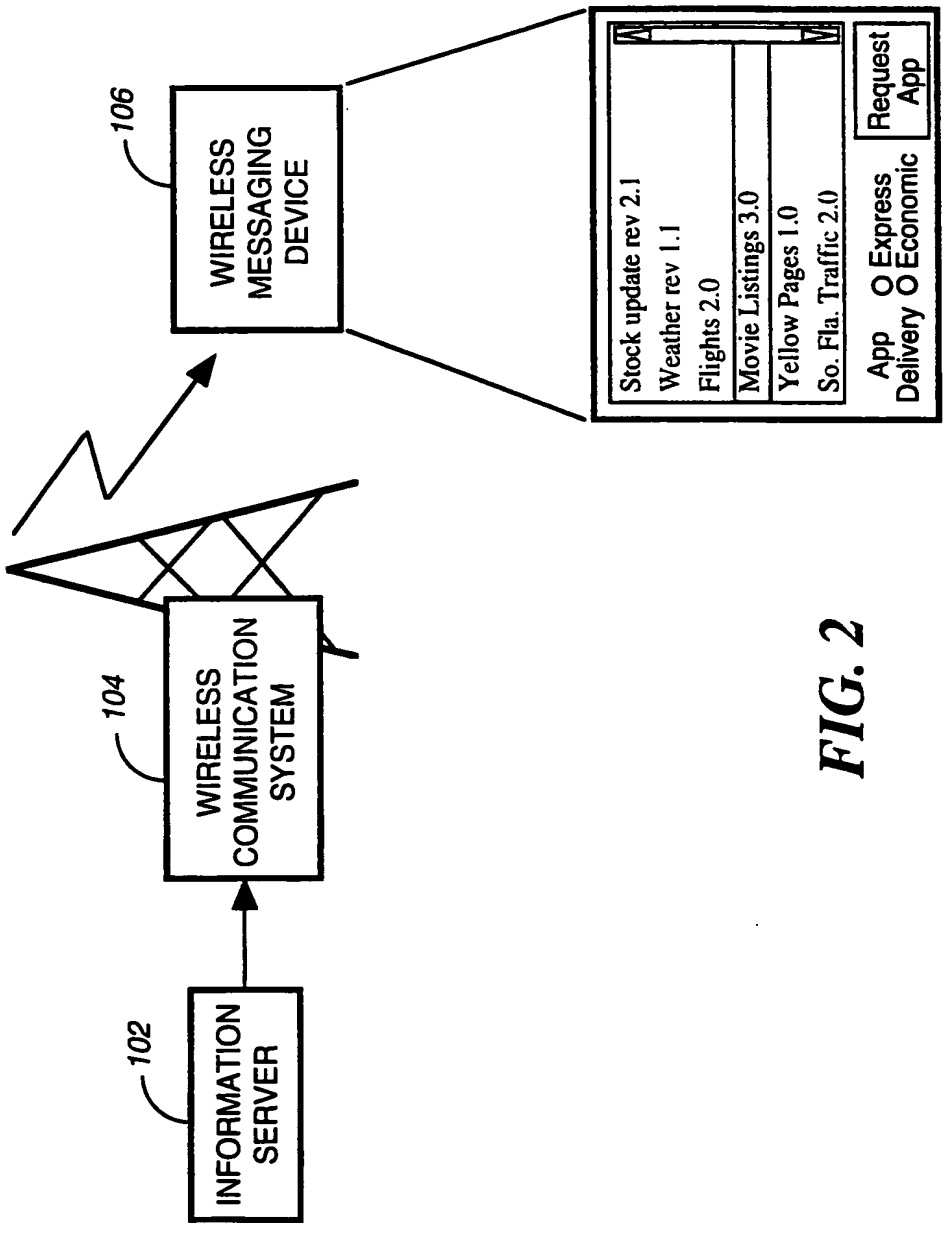
INFORMATION SERVER
102
WIRELESS COMMUNICATION SYSTEM
104
WIRELESS MESSAGING DEVICE
106
Stock update rev 2.1
Weather rev 1.1
Flights 2.0
Movie Listings 3.0
Yellow Pages 1.0
So. Fla. Traffic 2.0
App Delivery
O Express
O Economic
Request App

FIG. 2

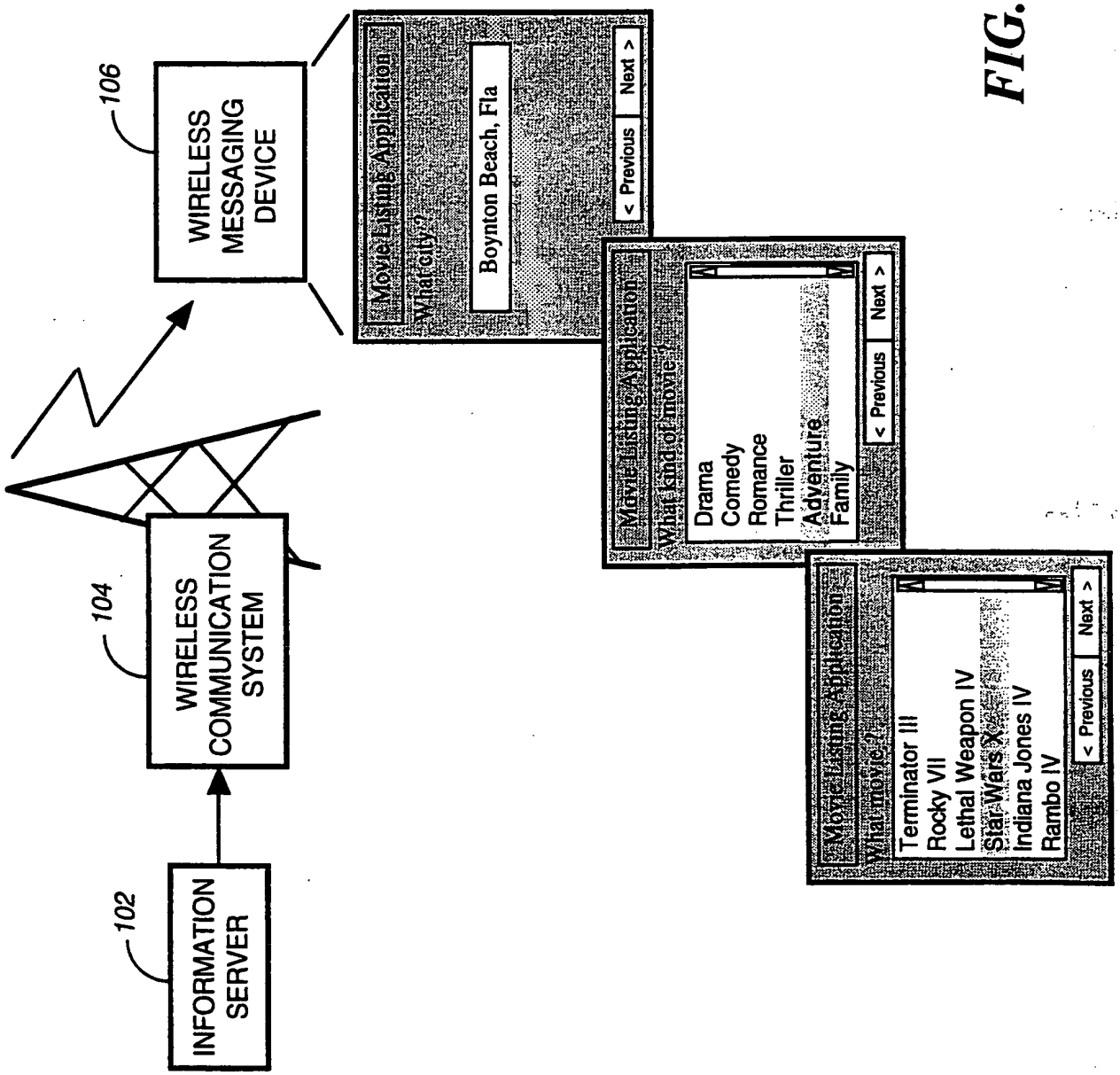
INFORMATION SERVER
102
WIRELESS COMMUNICATION SYSTEM
104
WIRELESS MESSAGING DEVICE
106
Movie Listing Application
What city?
Boynton Beach, Fla
< Previous
Next >
Movie Listing Application
What kind of movie?
Drama
Comedy
Romance
Thriller
Adventure
Family
< Previous
Next >
Movie Listing Application
What movie?
Terminator III
Rocky VII
Lethal Weapon IV
Star Wars X
Indiana Jones IV
Rambo IV
< Previous
Next >

FIG. 3

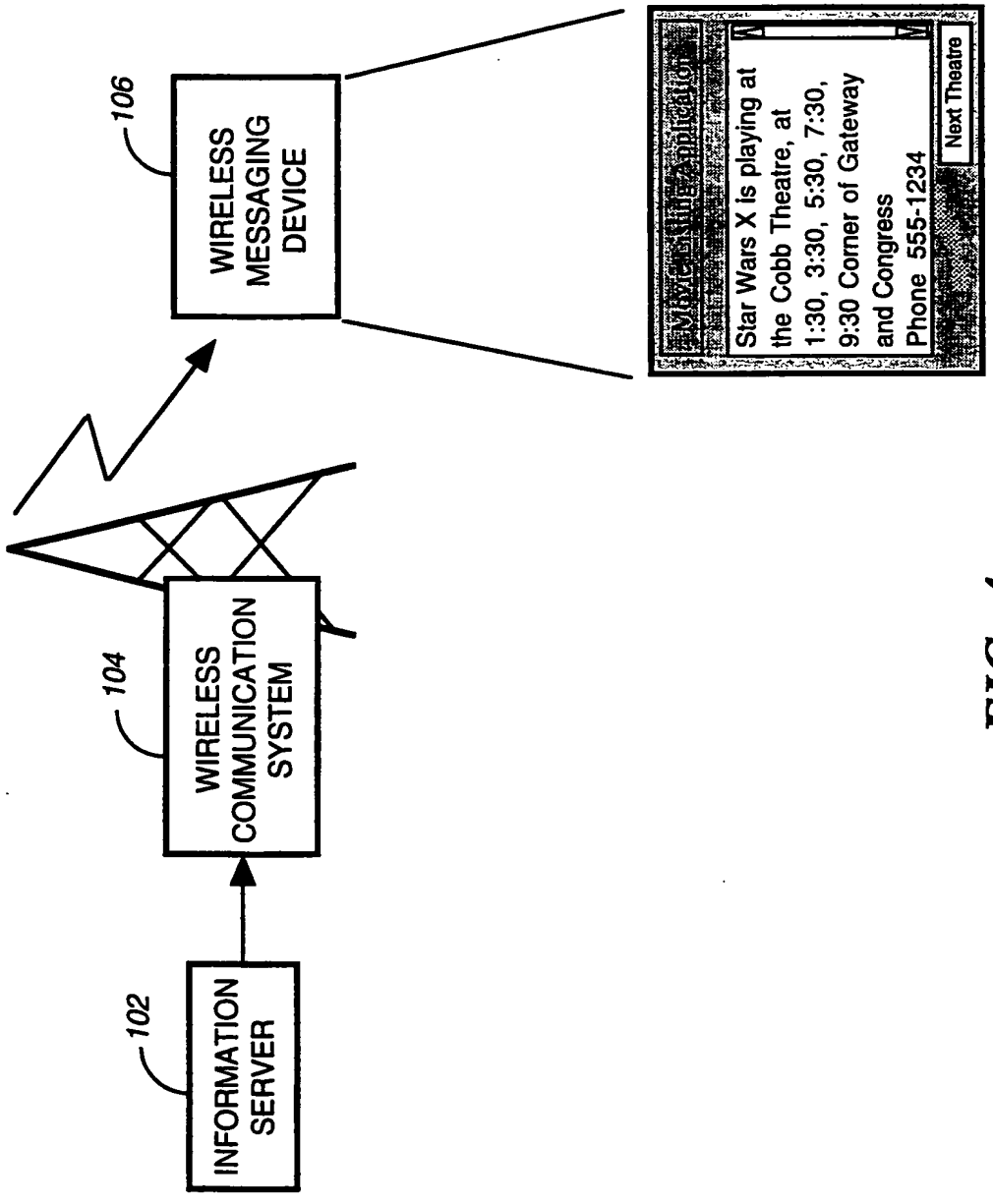
INFORMATION SERVER
102
WIRELESS COMMUNICATION SYSTEM
104
WIRELESS MESSAGING DEVICE
106
Movie Time Application
Star Wars X is playing at the Cobb Theatre, at 1:30, 3:30, 5:30, 7:30, 9:30 Corner of Gateway and Congress Phone 555-1234
Next Theatre

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/18144

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04Q 7/20

US CL :340/825.44, 825.47; 370/313, 338; 455/31.2, 31.3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 340/825.44, 825.47; 370/313, 338; 455/31.2, 31.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,555,446 A (JASINSKI) 10 SEPTEMBER 1996, see entire reference.	1-16
X, E	US 5,809,415 A (ROSSMANN) 15 SEPTEMBER 1998, see entire reference.	1-16

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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